

window, one thing of which was a large Tree, whose trunk and top I could plainly discover, as I could also the parts of my window, and my hand and fingers, if I held it between the Window and the Object; a small draught of nineteen of which, as they appear'd in the bigger Magnifying-glass to reflect the Image of the two windows of my Chamber, are delineated in the third Figure of the 23. Scheme.

Fourthly, that these rows were so dispos'd, that there was no quarter visible from his head that there was not some of these *Hemispheres* directed against; so that a Fly may be truly said to have an eye every way, and to be really *circumspect*. And it was further observable, that that way where the trunk of his body did hinder his prospect backward, these *protuberances* were elevated, as it were, above the plain of his shoulders and back, so that he was able to see backwards also over his back.

Fifthly, in living Flies, I have observ'd, that when any small mote or dust, which flies up and down the air, chances to light upon any part of these knobs, as it is sure to stick firmly to it and not fall, though through the *Microscope* it appears like a large stone or stick (which one would admire, especially since it is no ways probable that there is any wet or glutinous matter upon these *Hemispheres*, but I hope I shall render the reason in another place) so the Fly presently makes use of his two fore-feet in stead of eye-lids, with which, as with two Brooms or Brushes, they being all bestuck with Bristles, he often sweeps or brushes off what ever hinders the prospect of any of his *Hemispheres*, and then, to free his legs from that dirt, he rubs them one against another, the pointed Bristles or Tenters of which looking both one way, the rubbing of them to and fro one against another, does cleanse them in the same manner as I have observ'd those that Card Wool, to cleanse their Cards, by placing their Cards, so as the teeth of both look the same way, and then rubbing them one against another. In the very same manner do they brush and cleanse their bodies and wings, as I shall by and by shew; other creatures have other contrivances for the cleansing and clearing their eyes.

Sixthly, that the number of the Pearls or *Hemispheres* in the clusters of this Fly, was near 14000. which I judged by numbering certain rows of them several ways, and casting up the whole content, accounting each cluster to contain about seven thousand Pearls, three thousand of which were of a size, and consequently the rows not so thick, and the four thousand I accounted to be the number of the smaller Pearls next the feet and *proboscis*. Other Animals I observ'd to have yet a greater number, as the *Dragon-Fly* or *Adderbolt*: And others to have a much less company, as an *Ant*, &c. and several other small Flies and Insects.

Seventhly, that the order of these eyes or *Hemispheres* was altogether curious and admirable, they being plac'd in all kind of Flies, and aerial animals, in a most curious and regular ordination of triangular rows, in which order they are rang'd the nearest together that possibly they can, and consequently leave the least pits or trenches between them. But in *Shrimps*, *Crawfishes*, *Lobsters*, and such kinds of *Crustaceous* water Animals, I have yet

yet observ'd them rang'd in a quadrangular order, the rows cutting each other at right angles, which as it admits of a less number of Pearls in equal surfaces; so have those creatures a recompence made them, by having their eyes a little movable in their heads, which the other altogether want. So infinitely wise and provident do we find all the Dispensations in Nature, that certainly *Epicurus*, and his followers, must very little have consider'd them, who ascrib'd those things to the production of chance, that will, to a more attentive considerer, appear the products of the highest Wisdom and Providence.

Upon the Anatomy or Dissection of the Head, I observ'd these particulars:

First, that this outward skin, like the *Cornea* of the eyes of the greater Animals, was both flexible and transparent, and seem'd, through the *Microscope*, perfectly to resemble the very substance of the *Cornea* of a man's eye; for having cut out the cluster, and remov'd the dark and *mucons* stuff that is subjacent to it, I could see it transparent like a thin piece of skin, having as many cavities in the inside of it, and rang'd in the same order as it had *protuberances* on the outside, and this propriety, I found the same in all the Animals that had it, whether Flies or Shell-Fish.

Secondly, I found that all Animals that I have observ'd with those kind of eyes, have within this *Cornea*, a certain clear liquor or juice, though in a very little quantity, and,

I observ'd thirdly, that within that clear liquor, they had a kind of dark *mucons* lining, which was all spread round within the cavity of the cluster, and seem'd very near adjoining to it, the colour of which, in some Flies, was grey; in others, black; in others red; in others, of a mix'd colour; in others, spotted; and that the whole clusters, when look'd on whilst the Animal was living, or but newly kill'd, appear'd of the same colour that this coat (as I may so call it) appear'd of, when that outward skin, or *Cornea*, was remov'd.

Fourthly, that the rest of the capacity of the clusters was in some, as in *Dragon Flies*, &c. hollow, or empty; in others fill'd with some kind of substance; in blue Flies, with a reddish muscous substance, with *fibres* tending from the center or bottom outwards; and divers other, with various and differing kinds of substances.

That this curious contrivance is the organ of sight to all those various *Crustaceous* Animals, which are furnish'd with it, I think we need not doubt, if we consider but the several congruities it has with the eyes of greater creatures.

As first, that it is furnish'd with a *Cornea*, with a transparent humour, and with a *uvea* or *retina*, that the Figure of each of the small *Hemispheres* are very spherical, exactly polish'd, and most vivid, lively and plump, when the Animal is living, as in greater Animals, and in like manner dull, flaccid, and irregular, or shrunk, when the Animal is dead.

Next, that those creatures that are furnish'd with it, have no other organs that have any resemblance to the known eyes of other creatures.

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Thirdly,